OmniPCX© Open Gateway (O2G)
INSTALLATION AND ADMINISTRATION MANUAL

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Alcatel·Lucent
Enterprise

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While efforts were made to verify the completeness and accuracy of the information contained in this documentation, this document is provided “as is”. To get more accurate content concerning Cross Compatibilities, Product Limits, Software Policy and Feature Lists, please refer to the accurate documents published on the Business Partner Web Site.

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History

Edition 1	July 2018	Creation of document.
Edition 2	October 2018	Adding upgrade chapter 4.6 and minor modifications.

In this document, ROXE (REST API on OXE) has the same meaning as O2G.

Table of contents

O2G – INSTALLATION AND ADMINISTRATION GUIDE

Table of contents

O2G – INSTALLATION AND ADMINISTRATION GUIDE

Chapter

1

Overview

This document presents the O2G installation, configuration and administration guidelines. It helps you though the staging of O2G service and troubleshooting.

1.1 What is O2G

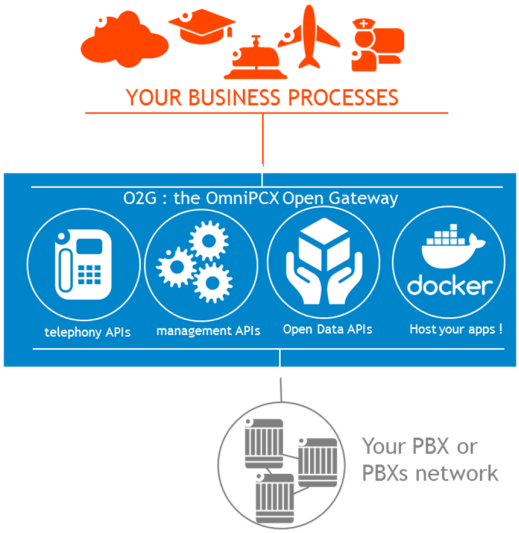
The OmniPCX Open Gateway (O2G) is a standalone application providing Open Web Services on top of OXE communication platforms.

This gateway simplifies the vertical integration and development of customer centric services from third party partners or end-customers

It provides a unique set of REST full APIs covering Advanced Telephony, Management and Analytics domains.

It is also a universal Openness server which can host your /ALE applications (running business rules / micro-services) thanks to a built-in DOCKER engine.

Software based and designed for mission critical environments (HA, Secured-by-design, CPE deployment in less than 10', 1 single server for all your network of OXEs in ABC-F)



Finally it support multiple Licensing models from perpetual license, to vendor specific agreement (TOKENID + revenue sharing) or consumption-based licenses in OpEx

1.2 Services/Resources provided

- Authentication : to be authenticate by the system
- Session management : to open, keep alive or close a session
- User information : to get user information
- Subscription management : to subscribe to notifications
- Call control : to allow actions related to the telephony
- Directory search : to allow actions related to the phone book
- Route management : to allow actions related to the routing
- Communication log : to allow actions related to the call history
- Event summary : to retrieves main counters of the user's event log
- Maintenance : to retrieve information about the system state
- Messaging : to allow actions related to the voice

- Phone Set Programming : Specific user management
- PBX management : to manage the OXE systems
- Analytics : to have some usages of the system

1.3 Online API REFERENCE documentation

REST documentation (developer oriented) is available in the server through the following URL:

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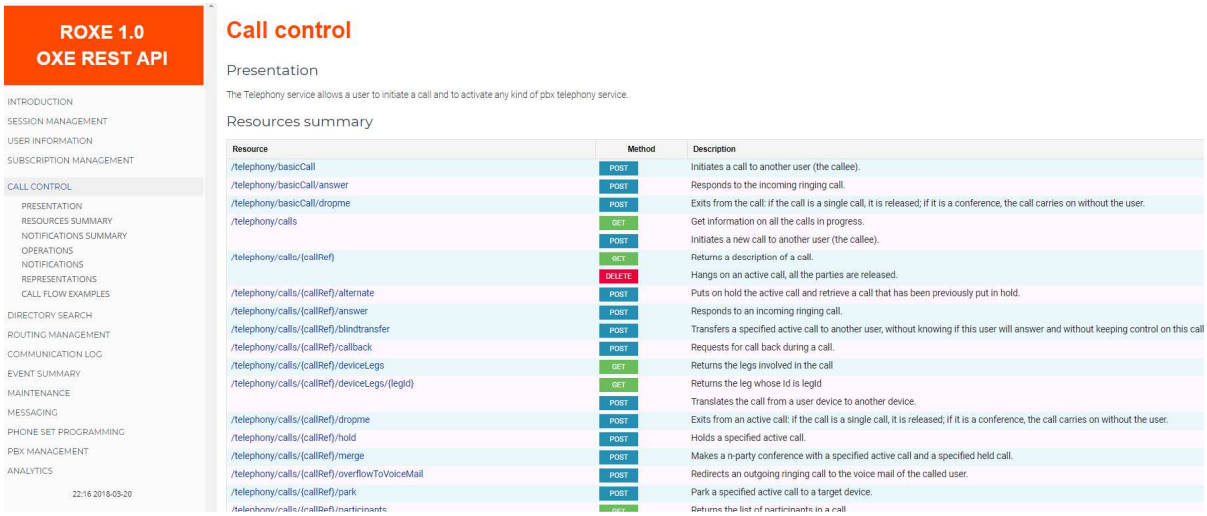
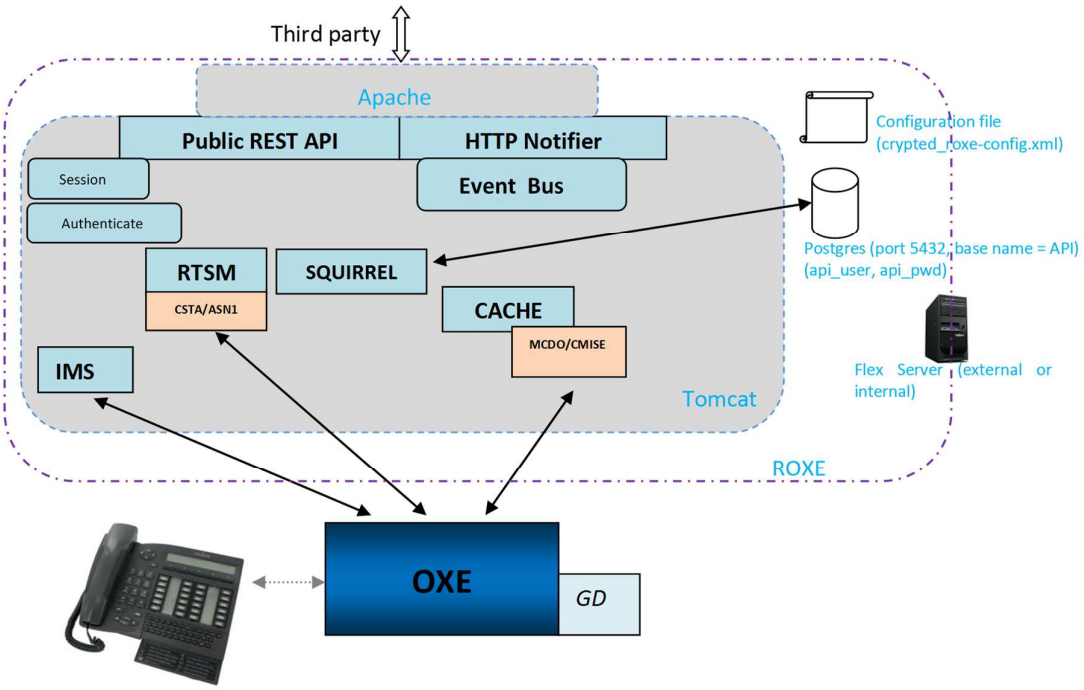


1.4 Technical building Blocks



RTSM	component that manages the telephony
SQUIRREL	component that manages the call history
MCDO	component that manages the pbx
IMS	component that manages the messaging
CMIS	Content Management Interoperability Services (for pbx management)
CSTA	Computer Supported Telecommunications Applications (for pbx interaction)

Chapter

2 Pre-requisites

2.1 Environment

O2G can run on BARE MATEL or Virtualized environment (VMware is supported).

The software is built on top a LINUX OS (SUSE) – delivered by ALE.

2.2 Cross-compatibility

O2G supports OXE starting from Release 11.2 minimum.

2.3 VM Sizing

Here are the minimum recommendations

- RAM 4G
- Disk 20G for 15K users
- CPU type : 4 cores

2.4 Licensing checks

Ensure you have the right licenses credentials (“FLELM key file or TOKEN) before starting O2G in production, (see Licensing chapter).

Ensure you have the OXE locks positioned (see Licensing chapter).

2.5 OXE configuration

2.5.1 FTP activation

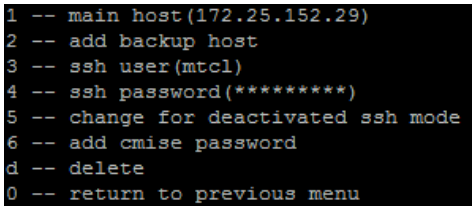
To activate the FTP access on OXE, you need to disable SSH mode (refer to the next chapter).

Note: Don’t forget to synchronize O2G through

its configuration tool “roxe_config.sh”:

Then choose menu 3 > then menu 3 > then the concerned OXE

Then choice 5: “Deactivated ssh mode”

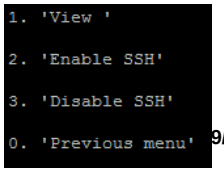


2.5.2 SSH activation

If you intend to use ANALYTICS API, OXE SSH must be activated.

Through MGR tool, launch the command

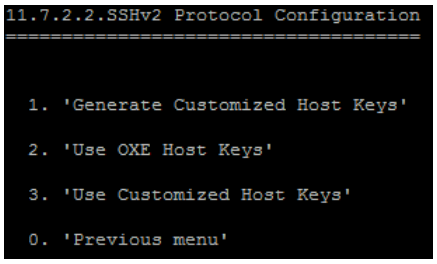
“netadmin -m” (**root mode**)



Then choose **menu 11** > then **menu 7** > the **menu 2**

Then choice 2: “**Enable SSH-2**”

Then need to confirm (“y”)



Choice 2: “**Use OXE Host Keys**”

Then need to confirm (“y”)

Then return to the previous menus to quit the tool and apply the new configuration.

Chapter

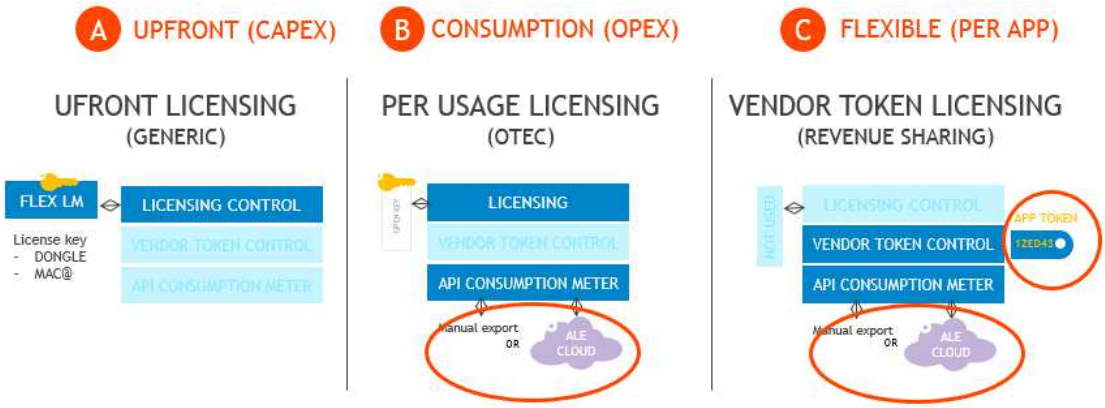
3

Licensing

3.1 Licensing models

O2G supports 3 licensing models:

- **UPFRONT (CAPEX) Licensing** – license is paid once – model proposed though ALE standard Offer – License is technically controlled through a KEY FILE (FLEXLM compatible) delivered from ALE electronic licensing portal based on purchased licenses.
- **PER USAGE (OPEX) licensing** – License is paid "on consumption basis" – model proposed though ALE OTEC Offer – License is technically controlled though an OPEN KEY FILE delivered once contractual onboarding of a customer on OTEC. License is paid per "measured usage".
- **PER VENDOR AGREEMENT licensing** – license is paid par a special contractual agreement between the vendor and ALE – License is technically controlled through a unique APPLICATION TOKEN.



3.2 FLEXlm license

O2G is using the same FLEXlm key as the one of OTMS/OTMC.

When O2 is sold alone (without OTMS/OTMC), the FLEXlm license is linked to:

- a **DONGLEID** when deployed on **Virtualized environments**
- a **MAC@** of the server hosting the FLEXlm server when deployed in **Cloud-connect mode**
- an **ALUID** (see next chapter) when deployed on Bare Metal or dedicated hardware server

When O2 is sold when an OT-MS is present and attached to an OXE node in the ACTIS configuration, O2G will inherit the Virtualisation/ Licensing capabilities of OTMS described below.

- If OTMS is > R2.3 -> O2G can be ALUID, DONGLE
- If OTMS is R2.3 or Higher -> O2G can be ALUID, DONGLE or MAC@ based.

3.2.1 Where to find the ALUID ?

You have to launch in CLI a program called **getaluid.**

When O2G is deployed on bare metal (physical machine) you get an id like :

```
[root@bstfe1047 ~]# getaluid
Unchanged ALUID=F6BE75F3F74FA50D874C9CA4E417989D  UtcDate=2018-04-17_12:09:09 (Aluid
was set on utcDate=2014-12-10_10:22:35)
```

When O2G runs on a Virtual Machine , … no results of course !

```
No ALUID on Virtual Machine UtcDate=2018-04-17_07:31:26 (no change since UtcDate=2018-
03-05_16:07:04 )
```

3.3 O2G Licenses

The REST API publics licenses used are:

- ROXE_API_TEL_BASIC : free license for basic telephony operations
- ROXE_API_TEL_ADVANCED : paid license for advanced telephony operations
- ROXE_API_MESSAGING : paid license for messaging operations
- ROXE_API_MANAGEMENT : paid license for management operations
- ROXE_API_PHONESETPROG : paid license for phone set programming operations
- ROXE_API_CONTACTCENTER : paid license for contact center operations
- ROXE_API_ANALYTICS : Just used as a right
- ROXE_HA : HA mode (used as a right)
- ROXE_API_TOKEN_MODE : TOKEN mode (used as a right: See chapter below)

3.4 User model – principles

O2G implements a USER model created automatically from the Subscribers objects and devices from connected OXEs. This Chapter describe the Synchronisation rules (htough CACHE) and user fields in heritage.

User “name” and “firstname”:

The "name" attribute at the REST API level will have the value of the "UTF-8 Directory Name" field of the “Subscriber” object of the OXE model. If this OXE field is empty, it will take the value of the field "Annu_Name" of the Subscriber object of OXE model. And finally if this OXE field is empty, it will be empty too.

The "firstname" attribute at the REST API level will have the value of the "UTF8_Phone_Book_First_Name" field of the Subscriber object of the OXE model. If this field OXE is empty, it will take the value of the field "Annu_First_Name" of the Subscriber object of OXE model. And finally if this OXE field is empty, it will be empty.

Cache manager

The Cache Manager is a data area used to store data in order to decrease the number of request with

OXE(s). This helps by Centralizing and synchronized data inside O2G, Optimizing runtime , sharing dynamic data

Data put in the Cache are :

- All subscribers (with A4980 right) of each OXE
- The phone book of each OXE

Mechanism

At the initialization of the system, the Cache is created, then the data are loading from OXE(s).

As soon as a data item is loaded in the cache, any action (create, update, delete) is notified to the cache by OXE(s).Thus a cache data item is always up-to-date.

In addition, if an application subscribes to the OnUserCreated OnUserInfoChanged and OnUserDeleted events, it will also receive the update.

3.5 Licenses accounting rules

For all licenses except "PBX MANAGEMENT":

Check-in of a license:

- The right license is taken during the first REST request per loginName (per user) , not per session
- If the same user opens several sessions, the licenses will be taken only for the first session. For the other open session by the same user, no further license will be taken.

Check-out of a license:

- All the user licenses will be freed during a logout or a timeout of its last session (the default value for session timeout is 1800 seconds/30 minutes).

Notice that for an **administrator** (one administrator session) who makes an action for 1000 different users, O2G will check-in 1000 licenses (one per user). All the licenses will be freed during a logout or a timeout of its last session.

For "PBX MANAGEMENT":

The licensing is based on the total number of subscribers (user) of all connected OXE systems. This value is measured once a day.

- If this value is inferior to the number of O2G licenses (ROXE_API_MANAGEMENT) then all methods are permitted
- If this value is superior by 110% (10% grace quantity is provided) than only GET method are accepted. This means that all elements are in Read only mode.

3.6 TOKEN BASED license

A TOKEN is an encrypted key, which contains the list of authorized features, for a given Partner and a Given Application. (VENDOR/APPLICATION ID).

The purpose of the token is to give for a limited validity period a set of features: When the token is used at session creation, the usage of feature will be controlled only thanks to this token feature list and no FLEXLm license will be taken.This means that FLEXlm licenses are not used (bypassed). However you need to have n “empty FLEXlm software key” and deploy a FLEXLM server internally for technical bootstrap reasons.

3.6.1 Token description

The token file must be generated by an ALE accredited person (Developer Program Manager (AAPP) or Product Line Manager) and then provided to the partner/customer with its associated unique identifier which must set it into the configuration.

The token contains:

- A clear part which can contain a free text (for example to describe the context of use of the token)
- An encrypted part formed with 3 parts which are checked by the server:
- A **validity period** (from a begin date to an end date)
- The ***list of features*** (ex: telephony, routing) which are authorized.
- A **unique identifier** which MUST correspond to the one given at installation (***licenseBypassTokenId***): this identifier is a free text chain, which may contain the identification of the partner or the final customer for which the token will be generated.

The encrypted part contains also some other fields which are not checked:

- A version
- A partner name
- An application name (which will be used as an ordinary applicationName for trace&logging purpose)

When a TOKEN is used, it must be given through the “applicationName” parameter (SessionRequest) during the login phase (POST …/sessions). At this step, the identifier and the validity period are checked and the session is refused if one of these parameters is not valid. The list of feature is stored in the session.

Note: If the “applicationName” is not a TOKEN (TOKEN, based on rights and not on a license reservation), it is the classic license-taking mechanism that is considered (through FLEXlm server).

When the user of the session wants to activate one of the services, the server checks that this service is part of the authorized one. No license in the FLEXlm server is taken but still need to configure a FLEX server and “empty key” (provided by ACTIS – order 0 users O2G).

3.6.2 Set the unique token identifier during the server installation.

The ***licenseBypassTokenId*** must be given at installation time (*roxe-installer.sh* tool) or may be set later in the configuration with *roxe-config.sh* tool.

3.6.3 Use a TOKEN

The token is used when an API user starts a session by putting the whole token file content value in the *applicationName* body parameter:

```
POST  https://ROXEserver/api/rest/1.0/sessions
{"applicationName":"[“this_is_the_clear_part_of_the_token”]qUECFVIyM7ZuO1ZvrBs//HFLjsww
Paq9OfYkOt//RQgFzOANMqL2c/uOr4IDE/e49/PNyb3GpdZwiYfdxQcrHv1TxSMY0iSMSQtfFHOP4OZjtVWkCOS
1hHsoqfcT0yT/976RswzpLPLmnRGFnT/z/ShzC0…
```

3.7 OXE locks

3.7.1 CSTA By-pass (# 158) lock (for CSTA monitoring)

The number of this lock can be check through OXE tool

```
“spadmin –m” (choice 2).
```

In the current OXE release, a client uses a bypass license/lock (# 158) for monitoring queries.

In ACTIS, this lock will always be positioned at 2 times the total number of OXE users by default (so nothing to do)

The number of CSTA monitored users can be biggest than the number of licenses. Example: There are 100 users with the A4980 rights managed in the pbx, and only 10 licenses in the FLEX licenses file. In this case, the first 10 users who will request the system, may have licenses.

For the OXE release, version >= M1 (12.0), this attribute will no longer check by OXE Call handling. In this case, all users will can be monitored.

3.7.2 A4980 (ClickAndPh) subscriber attribute

This attribute allows:

- O2G to know if the user must be considered and so monitored
- OXE Call Handling to retrieve information from CSTA private data (Number of missed calls, Number of unread voice messages, Number of call back requests)

For the OXE release, version >= M1 (12.0), this attribute will no longer check by OXE Call handling. The functionality will be always validated. Below, default value is 5000.

During login phase, if the subscriber hasn’t this attribute validate, an http error will be generated.

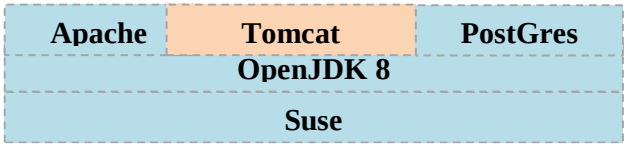
Chapter

4 INSTALLATION

4.1 Packages

The services (start/stop/restart) to install are:

- ALE OS (based on SUSE)
- Apache
- Tomcat
- PostgreSQL server
- .. tools



Version information for O2G Release 1.0:

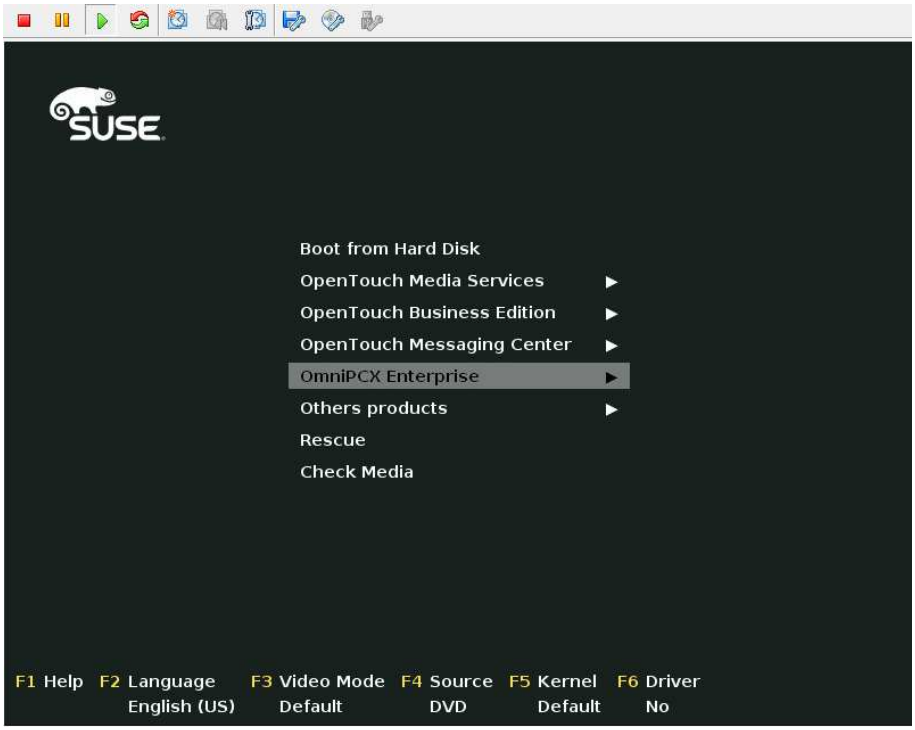
- openSUSE 42.1
- openjdk version 1.8.0_91
- Apache 2.4.16
- Apache Tomcat 8.0.32
- PostgreSQL 9.4

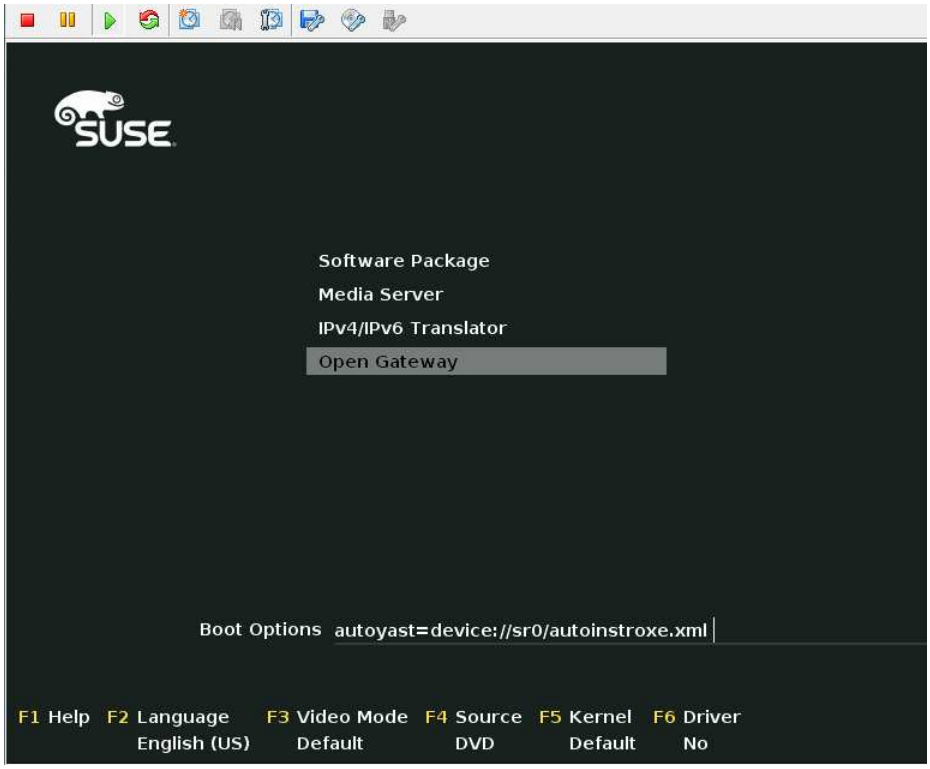
4.2 OS installation

The BootDVD ISO is necessary for OS installation.

On the BootDVD, pay attention to choose a language and keyboard type for OS installation (default is English (US) and Qwerty keyboard):

To start OS installation, scroll down and select “OmniPCX Enterprise” then in next screen “Open Gateway”.





By default, only one administrator account will be created: **root/letacla1**

After OS first installation, you will be requested to :

- Change root password
- Configure the network (IP address, FQDN, subnet mask, gateway, DNS)

After completing network configuration, logout and login with root account to apply the new network configuration.

This operation **takes about 10 minutes**.

4.3 FLEXlm server installation

The internal FLEXLM server is automatically deployed (silent) when deploying the O2G software. You can also use an external Flexlm serveur which is already existing in your deployment.

To configure

- o your choice during installation or
- o your choice after installation

Through configuration tool “roxe_config.sh”:

Then choose **menu 3** > then **menu 2** >

Note: for each mode switch, O2G system must be rebooted.

```
license configuration :
1 -- switch to external server
0 -- return to previous menu
```

OR

```
license configuration :
1 -- license Host (172.25.152.157)
2 -- switch to internal server
0 -- return to previous menu
```

Concerning the HA mode, each O2G instance (main/standby) has its owner FLEXlm server (internal mode) or use a remote FLEXlm server (external mode).

4.4 O2G package installation

After OS installation, install ROXE services. For that, a zip file is provided.

Copy this zip file into ROXE server and unzip it. 4 files should be obtained after unzipping ROXE bundle zip:

```
-rw-r--r-- 1 root root 61190226 Oct  4 11:16 roxe-binaries.tgz
-rw-r--r-- 1 root root 61212451 Oct 11 06:07 roxe-bundle.zip
-rw-r--r-- 1 root root     4381 Oct  4 11:16 roxe-config.template.xml
-rw-r--r-- 1 root root     4659 Oct  4 11:16 roxe-installer.sh
-rw-r--r-- 1 root root      123 Oct  4 11:25 version.properties
```

Make the file roxe-installer.sh as executable :
chmod 755 roxe-installer.sh

```
-rw-r--r-- 1 root root 61190226 Oct  4 11:16 roxe-binaries.tgz
-rw-r--r-- 1 root root 61212451 Oct 11 06:07 roxe-bundle.zip
-rw-r--r-- 1 root root     4381 Oct  4 11:16 roxe-config.template.xml
-rwxr-xr-x 1 root root     4659 Oct  4 11:16 roxe-installer.sh
-rw-r--r-- 1 root root      123 Oct  4 11:25 version.properties
```

- roxe-binaries.tgz => contains all binaries needed to install ROXE services
- roxe-installer.sh => installer script for ROXE services
- roxe-config.template.xml => a xml file template for configuration.
- version.properties => version file of ROXE

Execute the installer with following command:

./roxe-installer.sh

ROXE services installation takes **less than 1 minute**.

4.5 O2G configuration

The configuration could be done in 3 different manners:

- manual configuration through menus
- silent configuration from an existing configuration file (encrypted file)
- automatic configuration from an oxe configuration file (clear file).

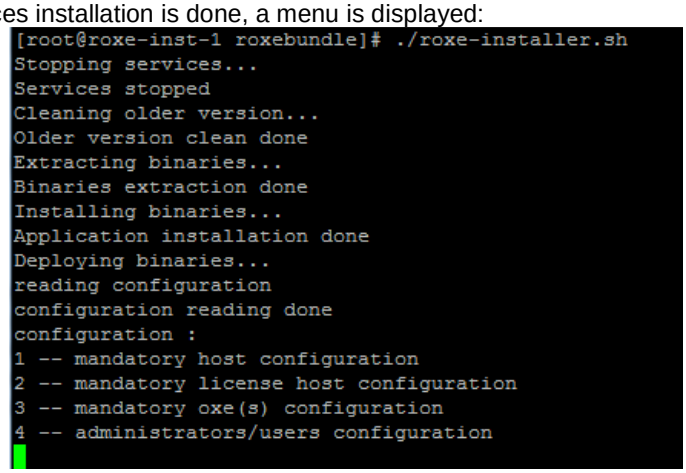
4.5.1 Manual configuration procedure

To start manual installation of ROXE services, launch:

```
roxe-installer.sh (with ./roxe-installer.sh command).
```

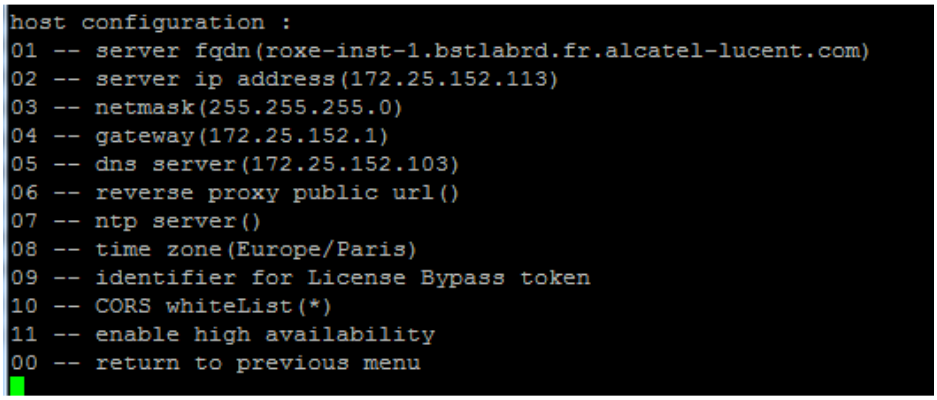
Pay attention to the execution right of roxe-installer.sh file (configure it with chmod command if needed).

Once ROXE services installation is done, a menu is displayed:



Three mandatory configurations must be done: host, license host and OXE(s) configuration.

Press 1 to access host configuration:



Press a number if a modification is needed on host configuration.

Press 00 to return to main menu.

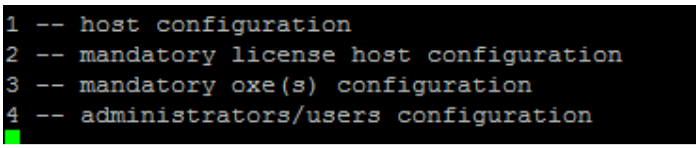
Enable high availability option is described in High availability chapter

Choice 9: If a license bypass token should be used, the identifier associated to this token must be filled here. The license bypass token identifier must be given to the installer, it has been used to generate the token by ALE.

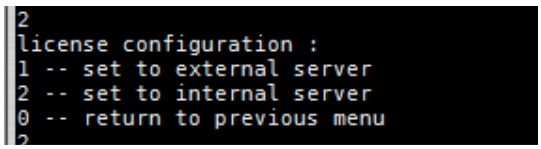
If the token identifier is not filled at installation, it may also be completed later with roxe-config.sh script. See above the Token chapter for more details.

Choice 10: CORS whitelist: ROXE server is designed to support CORS functionality: the list of third party servers which need to be allowed to make cross requests must be filled here.

After pressing 0, in main menu, host configuration isn't mandatory anymore



Press 2 to access license host configuration:



License host can be internal or external. If external server is chosen, a prompt to enter a license host will

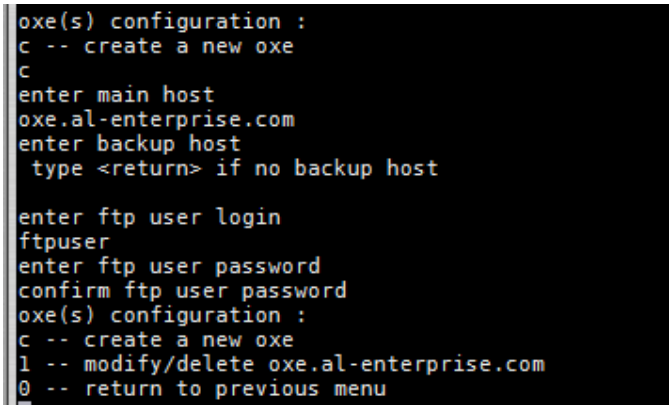
be displayed.

After configuring license host, press 0 to go back to main menu.

Press 3 to access OXE(s) configuration:

To create a new OXE, enter:

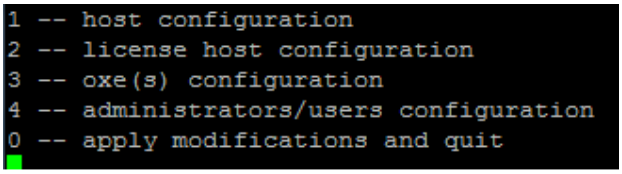
- main host (FQDN or IP@)
- backup host (FQDN or IP@) (optional)
- ftp user login (As administrator of pbx, it must be known: By default, it is the “adfexc” account
- ftp user password



Creation of as many OXEs is possible

Once an OXE is created, modification/deletion can be done by selecting its number in OXE menu

After configuring OXE(s), press 0 to go back to main menu.



At this point, all mandatory configuration is done.

Press 4 to modify root password or create/modify/delete new ROXE administrators

Press 0 to quit and apply configuration.

Once modification applied, **services are automatically started.**

If network configuration modification is done using a remote connection, a message is displayed to warn that this connection may be lost.

Note: Don't forget to exit the cmd window after this first "apply configuration" operation (the account profile updated). Else, you can't execute by example "service roxed status" command.

By default, a basic license file exists (embedded trial) .

So, the client will need to copy a valid license file into the folder defined as environment variable LICENSES_HOME for more licenses.

To start ROXE services, reboot the server or start services with the following command:

```
service roxed start
```

(the reboot time is inferior à 30 seconds).

*Note 1: To make some modifications to the configuration, use the script **roxe-config.sh** (see next chapters for more details).*

Note 2: if the configuration file already exists in (crypted_roxe-config.xml in /var/data/system), a new launch of roxe-installer.sh (without any argument) will restart the configuration with this current file (after stopping the service).

To manually inject a new configuration, the previous existing file must be removed.

To automatically inject a new configuration, please see the following silent procedure.

4.5.2 Configuration from an existing file

To start installation of ROXE services from an existing file, launch:

```
roxe-installer.sh (with ./roxe-installer.sh command)
```

giving the configuration file as argument, the existing encrypted configuration file path is given as parameter after the IMPORT keyword:

```
Ex: ./roxe-installer.sh IMPORT ./crypted_roxe_config.xml
```

4.5.3 Configuration from an OXE list description file

A silent configuration can be made by importing a clear configuration file containing the list of OXE nodes. The file must be given as parameter after the IMPORTOXE keyword:
Ex: ./roxe-installer.sh **IMPORTOXE** ./clear_oxe_config.xml

The clear file only contains the list of OXE nodes with their respective ftpUser.

```
<?xml version="1.0"?>
<config>
  <oxes>
    <oxe main="ip address-1" ftpUser="ftpUser-1" />
    <oxe main="ip address-2" ftpUser="ftpUser-2" />
  ...
    <oxe main="ip address-n" ftpUser="ftpUser-n" />
  </oxes>
```

```
</config>
```

In this case:

- the ftpPassword are by default set equal to the ftpUser values.
- host configuration is taken from system information
- and license host is set as local.

Note: In the same way than after the manual configuration, some modifications to the configuration can be made later (for example to change the default passwords) using the script ***roxe-config.sh*** *(see next chapters for more details).*

4.5.4 SSH activation (for ANALYTICS API)

```
Launch the "roxe_config.sh"
```

Then choose 3:

```
3
reading configuration
configuration reading done
configuration :
1 -- host configuration
2 -- license host configuration
3 -- oxe(s) configuration
4 -- administrators/users configuration
c -- cancel modifications and return to previous menu
0 -- apply modifications and return to previous menu
```

Then choose 3:

```
oxe(s) configuration :
c -- create a new oxe
1 -- modify/delete 172.25.152.29
2 -- modify/delete 172.25.152.34
3 -- modify/delete 172.25.152.35
0 -- return to previous menu
```

Then choose the related OXE to activate SSH:

Then choose 5:

```
1
1 -- main host(172.25.152.29)
2 -- add backup host
3 -- ftp user(adfexc)
4 -- ftp password(*********)
5 -- change for ssh activated mode
6 -- add cmise password
d -- delete
0 -- return to previous menu
```

```
5
enter ssh user login
mtcl
enter its password
confirm password
```

Enter the ssh credentials:(mtcl/mtcl by example)

Then return to the previous menus to quit the tool and apply the new configuration.

The reboot the tomcat is necessary (service tomcatd restart)

4.6 Upgrading the roxe-bundle to newer version

4.6.1 New Boot DVD and new Bundle are available

If a Boot DVD has to be used then it is like a new installation and you'll have to backup your roxe configuration or do it again using roxe-config.sh.

For Backup/Restore of your roxe configuration, please go to section 5.3.

Then see section 4.2 to install the Boot DVD and then the roxe-bundle.

4.6.2 Only roxe-bundle is available

Go directly to section 4.4 as there is no boot DVD to install.

4.7 PRS module installation & configuration

4.7.1 Installation

Copy the PRS PACKAGE (zip file) into O2G server (for example in the directory /PRS) and unzip it (example below).

```
drwxr-xr-x 2 root root    4096 Oct 25  2016 bin
drwxr-xr-x 2 root root    4096 Oct 25  2016 conf
-rw-r--r-- 1 root root 4299441 Mar  2 14:43 presentation_server-4.2.1.0.4.zip
drwxr-xr-x 2 root root    4096 Oct 25  2016 sigconfig
-rw-r--r-- 1 root root   43167 Oct 25  2016 sigconfig-sles12-4.2.1.0.4-224.tar.gz
```

4.7.2 Configuration

4.7.2.1 Coupling the OXE(s):

In the ~/conf directory, in the **CS.conf** file, add a line like this (in blue) by OXE :

```
<configuration xmlns="http://www.alcatel.fr/IPT/cs/v2.0">
<cs FirstRetrans="1000" IP="172.25.152.29" MTU="1007" Retrans="1000" UDP_KeepAlive="3"
UDP_Lost="9" WindowsSize="4" httpmode="DEFAULT" name="bsbice29" port="2570"></cs>
```

```
 ...
 <global Qos="0"/>
</configuration>
```

4.7.2.2 Coupling the FLEX server:

In the ~/conf directory, in the **Lisences.conf** file, add a line like this (in blue):

```
<configuration xmlns="http://www.alcatel.fr/IPT/cs/v2.0">
 <licenseServer address="vm-roxe1.bstlabrd.fr.alcatel-lucent.com" port="27000"
isRoxe=”true” ></licenseServer>
</configuration>
```

Note: In the license file, the associated license is **XMLIPTOUCH** if isRoxe=”false”, else it is **ROXE_API_XML_IPTOUCH** which is used.

4.7.2.3 Coupling Third party applications:

In the ~/conf directory, in the **applis.conf** file, add a line like this (in blue) by application.

Example:

```
<configuration xmlns="http://www.alcatel.fr/IPT/cs/v2.0">
 …
<appli ConfigScanPeriod="60" HTTPTimeout="120" InactivitySessionTimeout="300"
KeepAliveCountMax="5" NotifScanPeriod="60" PopUpTimeout="60" RegisterScanPeriod="60"
TermStateDeltaPeriod="10" TermStateSynchroAllPeriod="86400"
URL="http://sde-ot.acs.tlab.alcatel.ru/eccnoe/mymessaging" appId="MY_M" appIndex="1"
param="action=Register"></appli>

<appli ConfigScanPeriod="60" HTTPTimeout="120" InactivitySessionTimeout="300"
KeepAliveCountMax="5" NotifScanPeriod="60" PopUpTimeout="60" RegisterScanPeriod="60"
TermStateDeltaPeriod="10" TermStateSynchroAllPeriod="86400"
URL="http://sde-ot.acs.tlab.alcatel.ru/eccnoe/myphone" appId="MY_P" appIndex="2"
param="action=Register"></appli>
…
 <global/>
 …
</configuration>
```

- **Traces:**

In the ~/conf directory, in the **log4cxx.xml** file:

Adapt the PRS_TRACES_FILE appender:

```
<appender name="PRS_TRACES_FILE" class="RollingFileAppender">
<param name="file" value="/PRS/logs/prs_traces.log"/>              ← To adapt
 <param name="maxFileSize" value="5MB"/>
 <param name="maxBackupIndex" value="10"/>
 <layout class="PatternLayout">
       <param       name="ConversionPattern"
                    value="%d{%d/%m %H:%M:%S,%Q} %x %-5p %c - %m%n"/>
 </layout>
</appender>
```

Adapt the ALARMS_FILE appender:

```
<appender name="ALARMS_FILE" class="RollingFileAppender">
```

```
 <param name="file" value="/PRS/logs/alarms.log"/>                    ← To adapt
 <param name="maxFileSize" value="5MB"/>
 <param name="maxBackupIndex" value="10"/>
 <layout class="PatternLayout">
       <param       name="ConversionPattern"
value="%d{%d/%m %H:%M:%S,%Q} %x %-5p %c - %m%n"/>
 </layout>
</appender>
```

Create the concerned directory:

```
 mkdir /PRS/logs
```

- **Process:**

In the ~/bin directory,

```
chmod 777 pserver
chmod 777 pserverd
```

4.7.3 Start/Stop/Status

To start the PRS: ./pserverd start

To stop the PRS: ./pserverd stop

To have the PRS status: ./pserverd status

Chapter

5

Tools

5.1 roxed daemon

A daemon exists to manage ROXE services. This daemon can be invoked by the following commands:

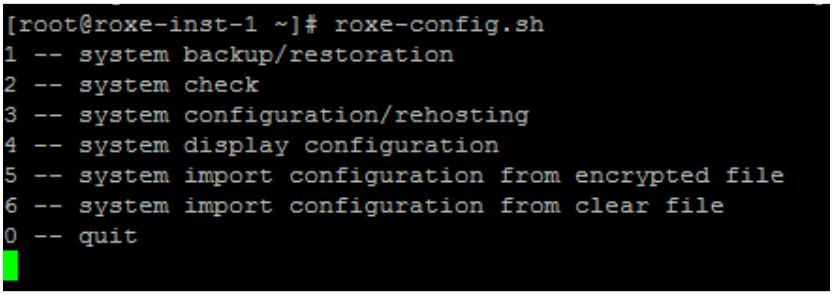
```
roxeservice roxed start/stop/restart/status

Or

service roxed start/stop/restart/status
```

5.2 roxe-config.sh

A specific script roxe-config.sh will allow to make some actions.



This script offers several actions:

- 1 -- system backup/restoration

  To save/restore the important files of the system
- 2 -- system check

  To check the state of the system (status of the services)
- 3 -- system configuration/rehosting

  To configure or make some change on system parameters (host, license host or OXE(s))
- 4 -- system display configuration

  To display system configuration (network parameters, license, OXE(s), …)
- 5 -- system configuration from an existing encrypted file

  To import an existing crypted configuration file
- 6 -- system configuration from a limited OXE list (xml file in clear).

  The config file only contains the OXE node list (see chapter above).

5.3 Backup/Restore

For the backup/restore database of the ROXE package.

The database backup/restore operation can be automatically called by this script with option 1 for backup and 6 for restore.

The backup is composed of:

- the ROXE system parameters (host configuration, license and OXE(s)).
- the 2 databases needed by the ROXE services (API and CALLLOG)

Backup can only be created locally and is stored in a tgz format under /var/data/backup.

It is possible to restore one of the backup stored under /var/data/backup or to restore an archive stored somewhere else by executing the command “roxe-config.sh –restore <archive file>” (outside of the roxe-config.sh script).

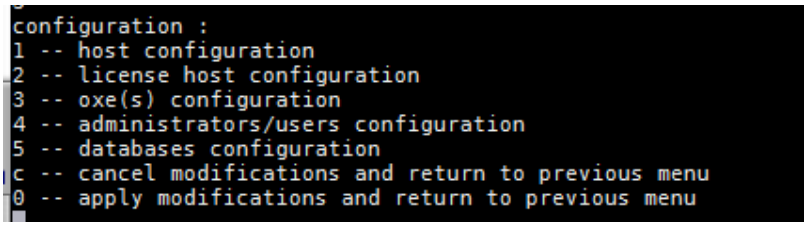
5.4 System check

A system check can be done with roxe-config.sh script. This check displays the status of the ROXE services (STARTED, STOPPED …). The given result is equivalent to the command “roxeservice roxed status”.

Note: Perhaps a web page will be better to display some information.

5.5 System configuration/re-hosting

The **roxe-config.sh** script offers the possibility to modify the system configuration (host configuration, license configuration and OXE(s) configuration) and thus to rehost the system. Rehosting the system consists in change of FQDN and/or IP address.



- To change host configuration (IP parameters) or to rehost system, press 1.

```
host configuration :
01 -- server fqdn(vm-roxe1.bstlabrd.fr.alcatel-lucent.com)
02 -- server ip address(172.25.152.156)
03 -- netmask(255.255.255.0)
04 -- gateway(172.25.152.1)
05 -- dns server(172.25.152.103)
06 -- reverse proxy public url()
07 -- ntp server(10.67.1.7)
08 -- time zone(Europe/Paris)
09 -- identifier for License Bypass token
10 -- CORS whiteList(*)
11 -- Disable HTTP
12 -- enable high availability
00 -- return to previous menu
```

-

It is possible to modify/add one or several parameters (server fqdn, ip address, netmask, gateway, dns server, identifier for the license bypass token…). To modify several parameters, select each parameter to modify one by one by entering the corresponding choice number.

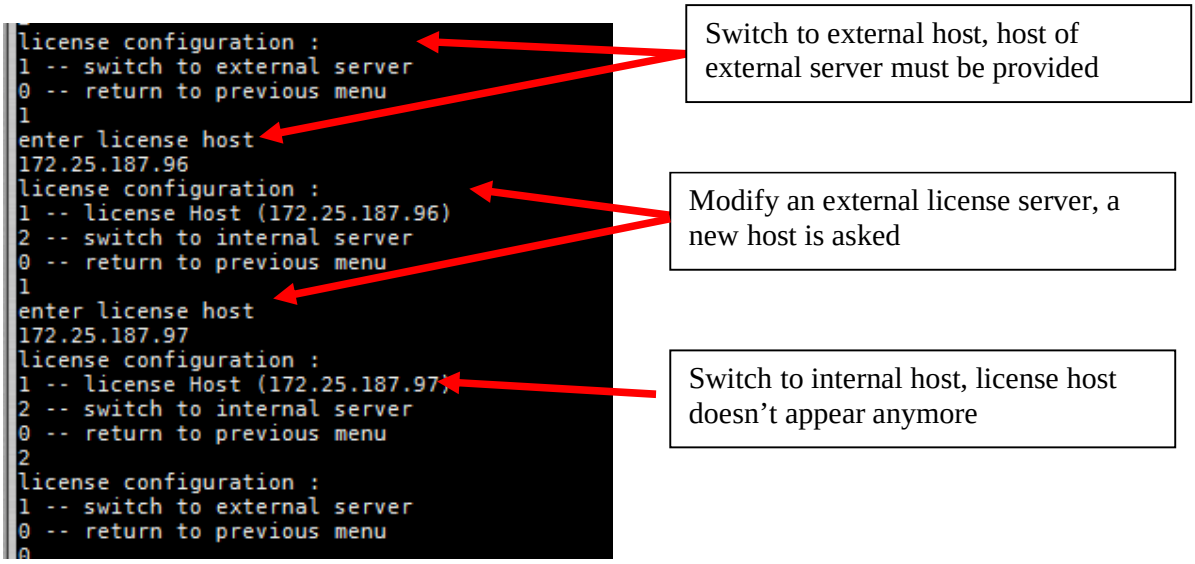
- To change license host configuration, press 2.

License server can be internal or external.

In both case, a valid license file into ${LICENSES_HOME} folder is needed.

For an external server, the host of license server has to be provided.

Once external server is set, it is also possible to change the license server host



- To access OXE(s) configuration, press 3.

```
oxe(s) configuration :
c -- create a new oxe
1 -- modify/delete oxe.al-enterprise.com
2 -- modify/delete oxe2.al-enterprise.com
3 -- modify/delete oxe3.al-enterprise.com
4 -- modify/delete roxe4.fr.al-enterpise.com
0 -- return to previous menu
4
1 -- main host(roxe4.fr.al-enterpise.com)
2 -- add backup host
3 -- ftp user(adfexc)
4 -- ftp password(*********)
d -- delete
0 -- return to previous menu
```

It is possible to:

- Create a new OXE
- Modify/Delete an existing OXE

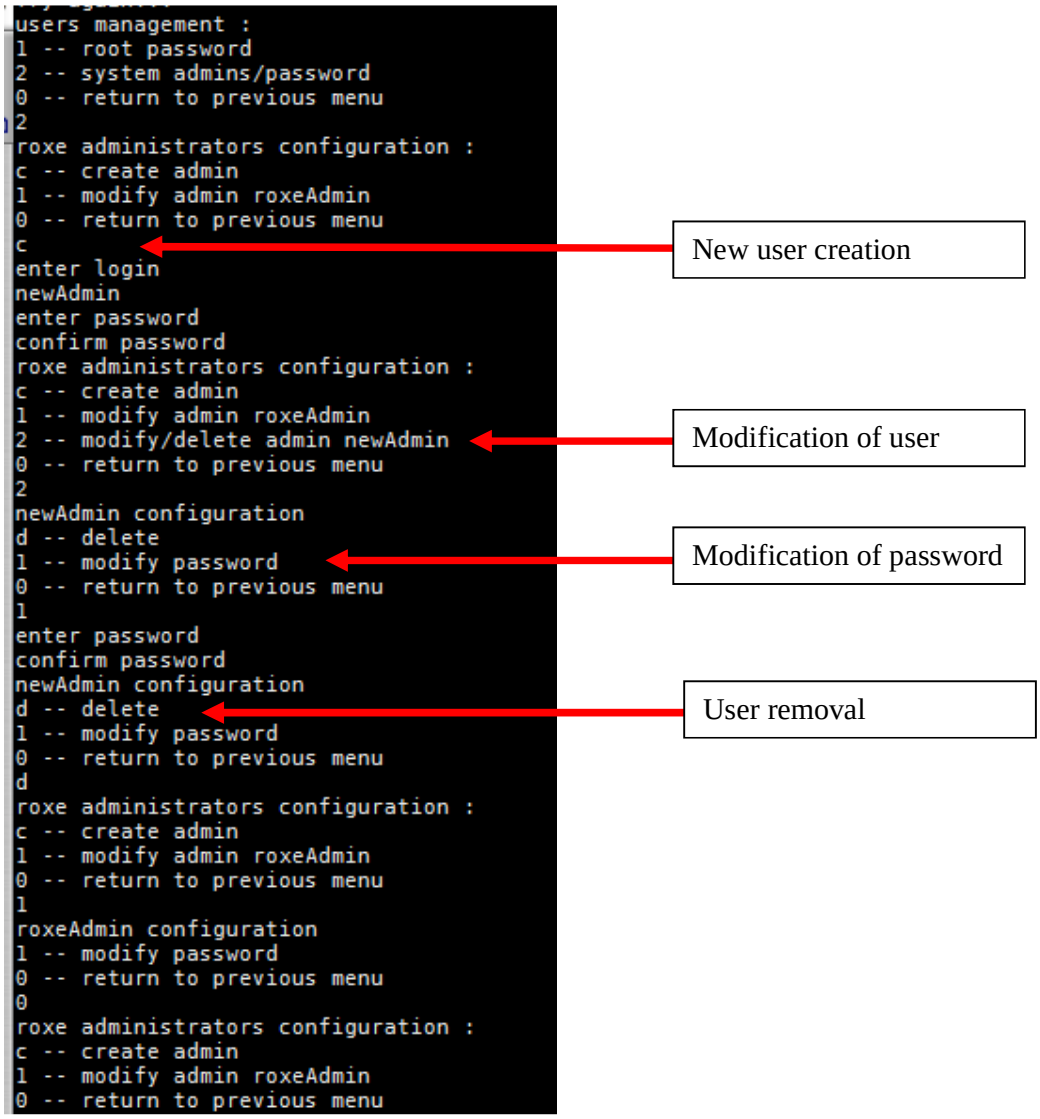
Note: For all OXE, all the users with the A4980 right are automatically consider by the system (The numeration must be homogenous between all oxes). In case of creation/update or delete too.

Once selected, it is possible to change OXE's parameters or delete it

- To access administrators/users configuration, press 4

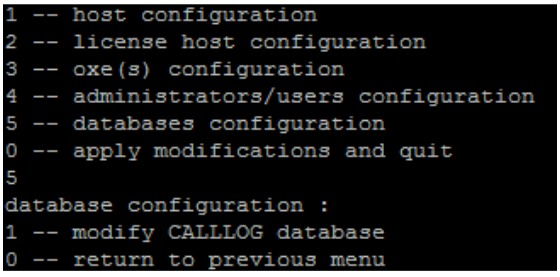
  To change root password, press 1
  It is possible to abort the action
  Once the password is entered and controlled, modification is done on system.

```
users management :
1 -- root password
2 -- system admins/password
0 -- return to previous menu
1
enter new root user password
type <return> to abort
aborted...
users management :
1 -- root password
2 -- system admins/password
0 -- return to previous menu
1
enter new root user password
type <return> to abort
confirm root user password
passwords doesn't match...
users management :
1 -- root password
2 -- system admins/password
0 -- return to previous menu
1
enter new root user password
type <return> to abort
confirm root user password
users management :
1 -- root password
2 -- system admins/password
0 -- return to previous menu
1
```



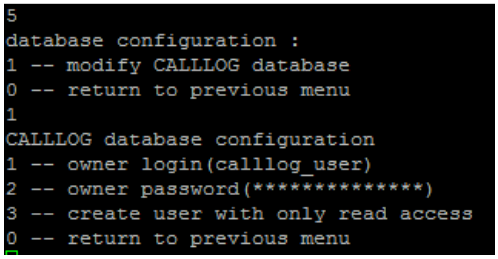
To create/modify/delete a ROXE administrator press 2

- To acces databases configuration, press 5

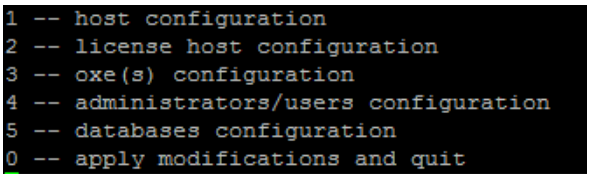


Modify owner login and password
Create/modify a user login and password
It is also possible to delete a database

Warning API and CALLLOG databases can't be deleted



Once all modifications done, press 0 to apply



5.5.1 system import configuration

To apply a new configuration, it is possible to use a template file with new information
Press 5 in main menu, then enter the full path file
A check is done on the file and the modification are applied if the file is correct
If the file is incorrect, errors are displayed and importation is aborted

5.5.2 crypted_roxe-config.xml

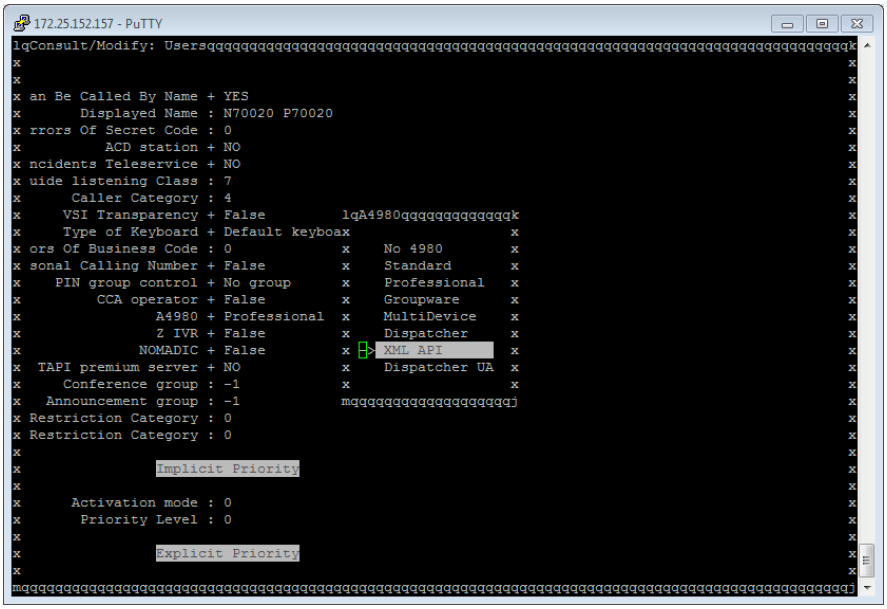
Some previous configuration data are save in the file: /var/data/system/crypted_roxe-config.xml

- The content of this file must not be readable (must be scripted)
- This file can be manually updated/copied (through roxe-config.sh)

5.5.3 Specific configuration

Each user must have the A4980 right in OXE.

In MGR, this attribute is visible in subscriber object:



Caution:
A user and his devices must have the same 4980 right, else the good behavior can be guarantee.
It means that if the user or one of each device doesn't have this right, the user and all each device will be not consider.

5.6 Flex server

The Flex server may be locally or remotely.

Each OXE has a specific CPU ID which must be in coherence with the file license of the FLEX server.

- Check OXE configuration:
  - Through "spadmin" tool (choice 7): Example "Cpu Id 0 = ***K00001514***"
  - Through "mgr" tool: System>licenses>

```
FlexLM Licensing Enabled + YES
  Flex Server IP Address : 172.25.152.181
        Flex Server Port : 27000
Flex Server 2 IP Address : 00.00.00.00
      Flex Server 2 Port : 0
Cloud Connect RTR Enabled + NO
     ProductID discovery + YES
        Use Flex License + NO
```

- Check FLEX server license file:

```
INCREMENT K00001514 ALCFIRM 1.0 permanent 4 ISSUED=25-sep-2016 \
 SIGN="01BC 89C4 8959 A1D8 18B0 C3AD 4758 55F8 2D4F 0765 2400 \
 DE4A FD14 999F 4426 6D14 C2EE C656 6552 0F68 73E5"
```

Chapter

6

DOCKER

6.1 Docker

Docker allows to package an application with all its dependencies into a standardized unit for software development.The ROXE system provides the packages for that

6.1.1 Start Docker

```
# systemctl start docker
# systemctl enable docker
```

Configure Docker to limit the size of log files in containers:

```
# vi /etc/sysconfig/docker and add:
```

```
DOCKER_OPTS=”--log-opt max-size=50m --log-opt max-file=5”
```

Behind an Http proxy server, for example in corporate settings, you will need to add the following configuration in the Docker system service file:

Create system drop-in directory for the docker service:

```
# mkdir -p /etc/systemd/system/docker.service.d
```

6.1.2 Create a file http-proxy.conf in this directory

```
# vi /etc/systemd/system/docker.service.d/http-proxy.conf
```

Add these lines in the file:

```
[Service]
Environment="HTTP_PROXY=http://<proxy ip>:<proxy port>/"
```

Flush changes:

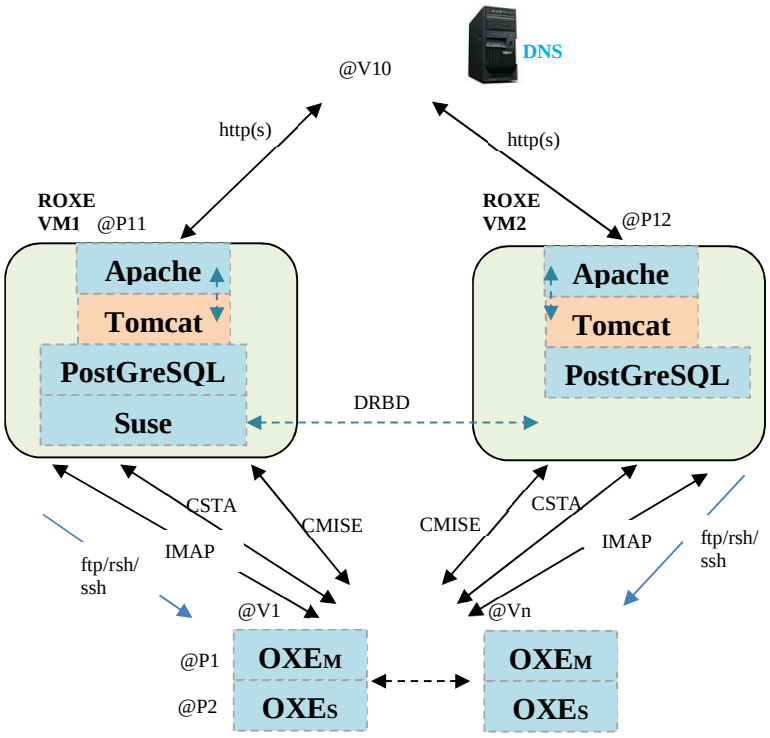
```
# systemctl daemon-reload
# systemctl restart docker
```

Chapter

7

High Availability (HA)

7.1 Overview



At initialization time

During the start-up of the two VMs, the fastest (by example VM1@P11) takes the logical address (@V10).

The ROXE solution controller (SC) of VM1@P11 finds that the logical address is available, so this address is activated and the standby services started (Tomcat and PostgreSQL started). The VM1@P11 is in active role. As a result, the SC of the other VM2@P12 detect that the logical address is unavailable, so VM2@P12 remains in standby mode (Tomcat and PostgreSQL stopped).

VM1@P11: Active role

VM2@P12: Standby role

Switch over after a stop

By example VM1@P11 is stopped (service roxed stop). In this case the SC of VM1@P11 is stopped and the logical address (@V10) is released.

As the SC of VM2@P12 is running, this release is detected and logical address (@V10) is recovered by the VM2@P12.

VM2@P12: Active role

When the VM1@P11 will restart, it will be in standby role.

Switch over after a loss of IP link or a crash

Same behavior as before.

Note: A specific mechanism checks the releasing of the logical address every 30 seconds. So, a switching can be triggered at maximum after 30 seconds.

Caution:

- CSTA monitoring 20000 Max
- The couple (Apache, Tomcat) should run together in the same VM (or not) to simplify the performing and the debugging.
- A unique logical(virtual) address can be added to the physical addresses of each VMs. It is this address that must be used by the application.

7.2 OXE main/backup or OXE Networking

An OXE system can be configured in main/backup or/and in network configuration.

All physical addresses of these OXEs will be in **crypted_roxe-config.xml** configuration file.

7.3 PostgreSQL

PostgreSQL use its own partition for data.

When HA is enabled, this partition is replicated to each server through DRBD module.

Partition can be active (postgreSQL is started) or standby (postgreSQL is stopped).

As only one partition can have active role, PostgreSQL works in active/standby mode.

Only one PostgreSQL service can be active at a time.

7.4 Configuration

7.4.1 Installation from scratch

7.4.1.1 Primary server

Configure all mandatory parameters like standalone installation

Except in host configuration menu, press enable high availability number.

Press 1 primary server and 1 again for installation from scratch

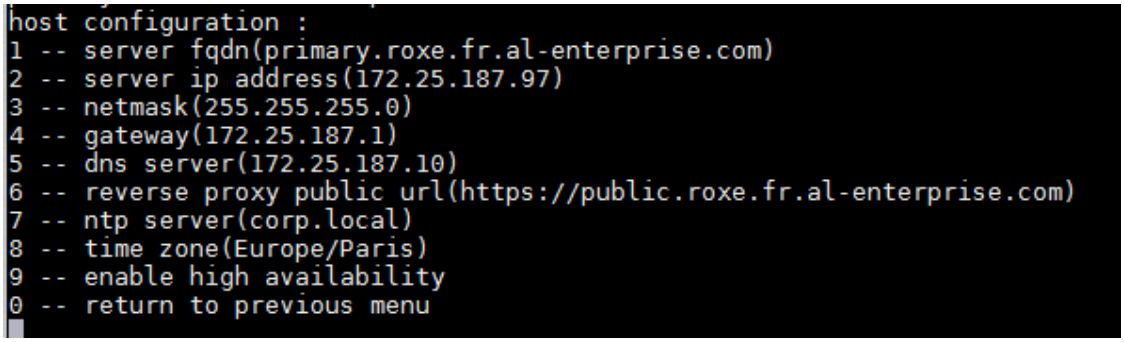
Enter secondary server ip address

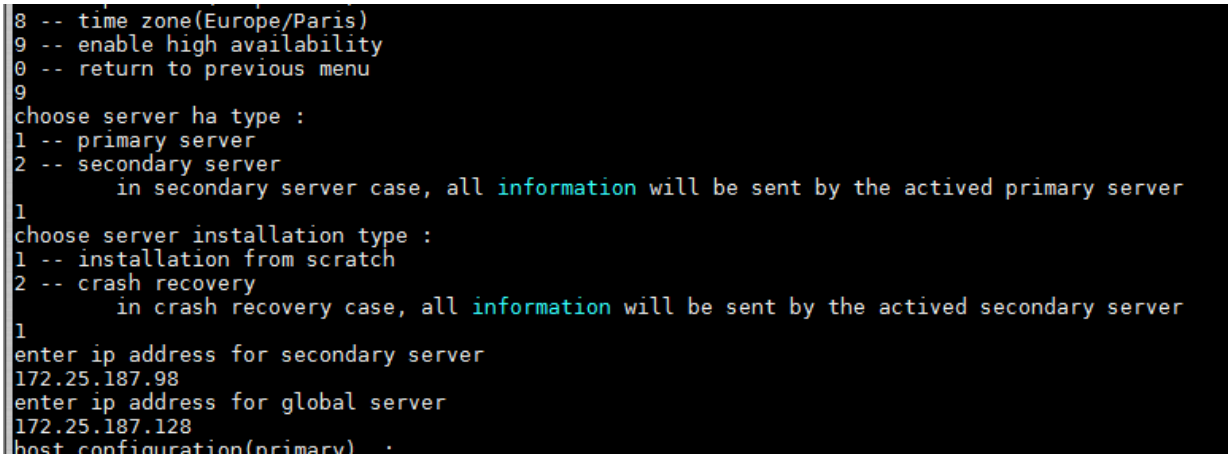
The fqdn should be automatically resolved by dns server. If not, its fqdn is asked

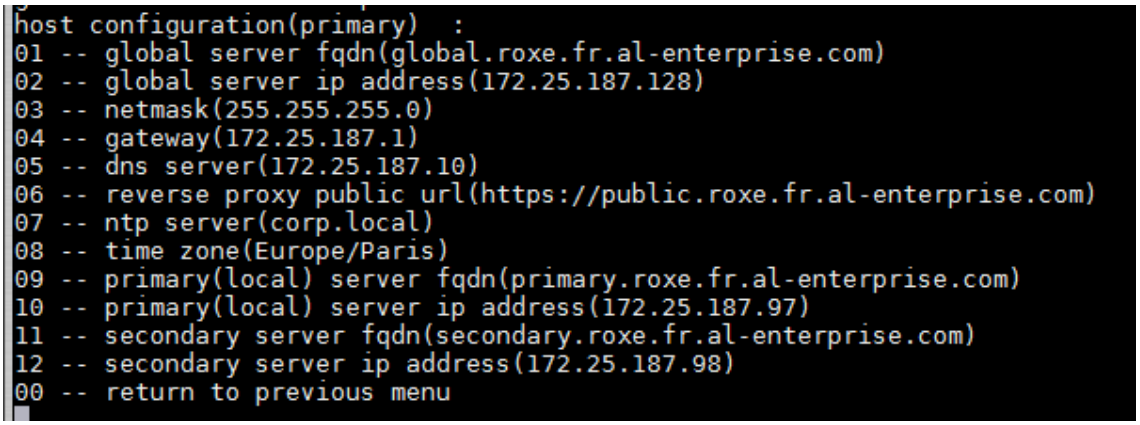
Enter global server ip address

The fqdn should be automatically resolved by dns server. If not, its fqdn is asked

If the resolved fqdn is not correct, it is still possible to change it in the host configuration menu







Once done apply modifications on main menu like a standalone installation

7.4.1.2 Secondary server

Go directly to host configuration menu

Configure needed parameters to communicate with primary server (ip address, netmask, gateway…) if needed

Press enable high availability number

Press 2 secondary server

Enter primary server ip address

All information will be send to secondary server by primary server once it is configured and started

```
[root@bstpiil1098 ~]# ./roxe-installer.sh
Extracting binaries...
Binaries extraction done
Installing application...
Application installation/update done
Installing/updating binaries...
configuration :
1 -- mandatory host configuration
2 -- mandatory license host configuration
3 -- mandatory oxe(s) configuration
4 -- administrators/users configuration
5 -- databases configuration
1
host configuration :
1 -- server fqdn(bstpiil1098.fr.alcatel-lucent.com)
2 -- server ip address(172.25.187.98)
3 -- netmask(255.255.255.0)
4 -- gateway(172.25.187.1)
5 -- dns server(172.25.187.10)
6 -- reverse proxy public url()
7 -- ntp server()
8 -- time zone(US/Eastern)
9 -- enable high availability
0 -- return to previous menu
9
choose server ha type :
1 -- primary server
2 -- secondary server
        in secondary server case, all information will be sent by the actived primary server
2
enter ip address for primary server
172.25.187.97
waiting for configuration availability from primary server
configuration available
applying modifications...
applying modifications...done
Starting ROXE Services 1.0 SNAPSHOT
postgresql:
Application is managed by solution control                 [  OK  ]
tomcat:
Application is managed by solution control                 [  OK  ]
apache:
Application is                                             [STARTED]
flexlm:
Application is                                             [STARTED]
solution_control:
Application is                                             [STARTED]
Start time : 1s
Binaries installation/update done
boot media check :
version installed :     _12.1.009.000_
version delivered :     _12.1.009.001_
boot media : version needs update
Starting ROXE Services 1.0 SNAPSHOT
postgresql:
Application is managed by solution control                 [  OK  ]
tomcat:
Application is managed by solution control                 [  OK  ]
apache:
Application is                                             [STARTED]
flexlm:
Application is                                             [STARTED]
solution_control:
Application is                                             [STARTED]
Start time : 0s
```

7.4.2 Enable high availability

It is possible to enable high availability on a standalone server.

For no changes for the clients, the actual ip address/fqdn of the server became the global virtual ip address and a new ip address/fqdn is needed for the primary server

7.4.2.1 Primary server

Launch roxe-config.sh

Press system configuration/rehosting number

Press host configuration number

Press enable high availability number

Press 1 primary server

Enter new ip address for primary server

The fqdn should be automatically resolved by dns server. If not, its fqdn is asked

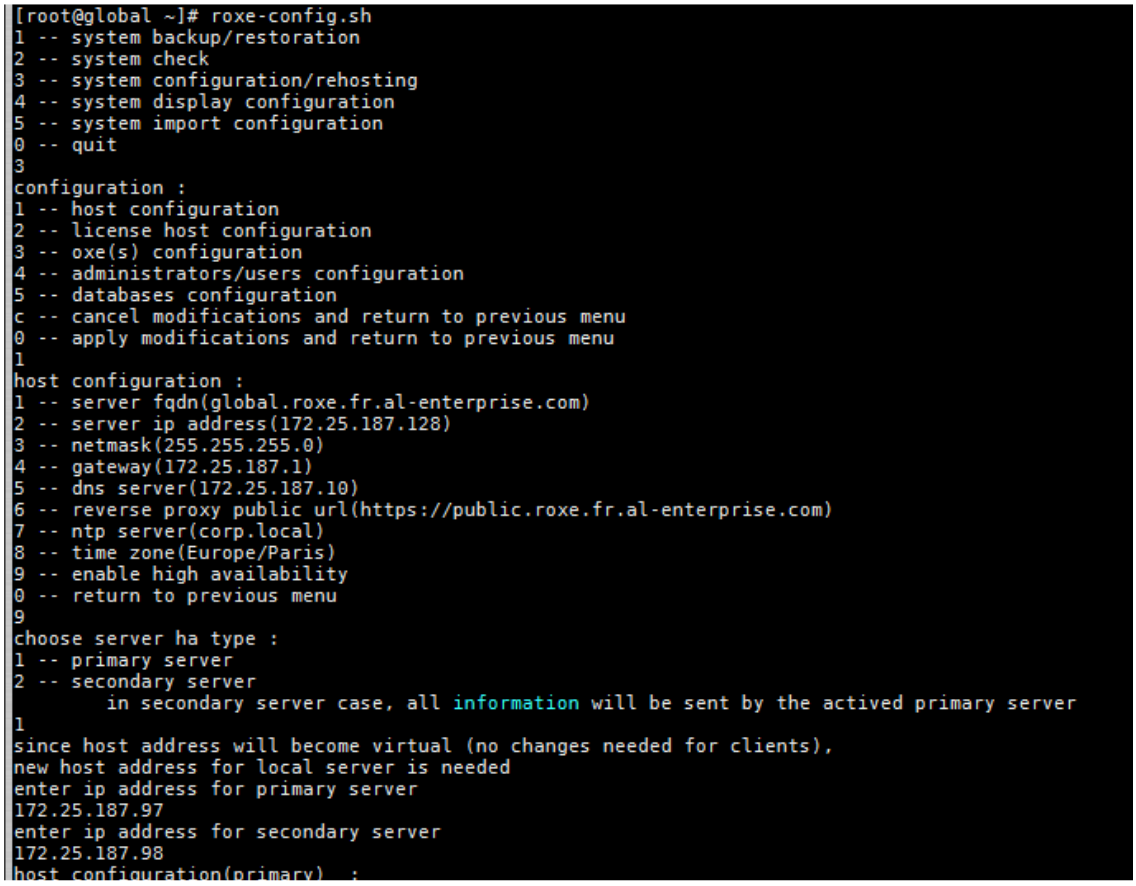
Enter secondary server ip address

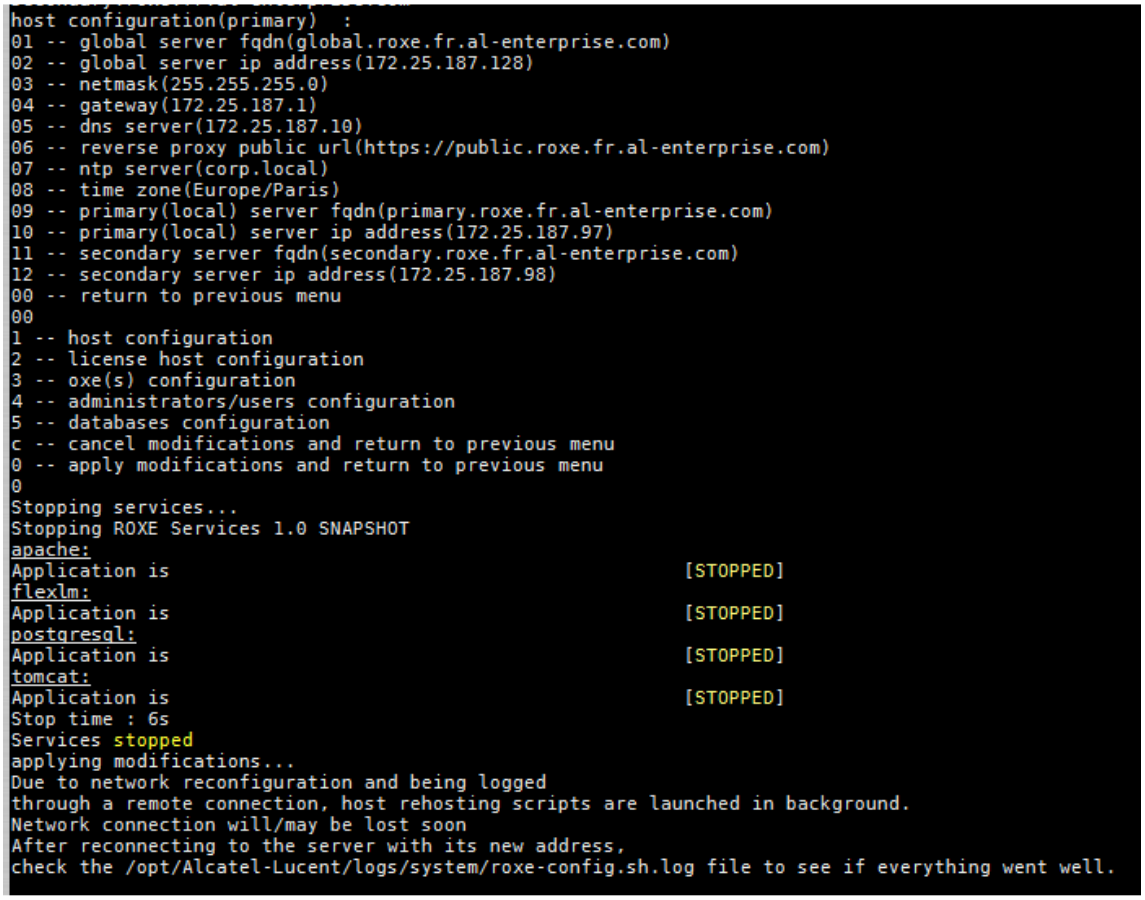
The fqdn should be automatically resolved by dns server. If not, its fqdn is asked

If the resolved fqdn is not correct, it is still possible to change it in the host configuration menu

If the modification is done through a remote connection, this connection will be broken since the ip address/host of the server is changed.

In that case, it is needed to have a look at the indicated log file.


[root@global ~]# roxe-config.sh
1 -- system backup/restoration
2 -- system check
3 -- system configuration/rehosting
4 -- system display configuration
5 -- system import configuration
0 -- quit
3
configuration :
1 -- host configuration
2 -- license host configuration
3 -- oxe(s) configuration
4 -- administrators/users configuration
5 -- databases configuration
c -- cancel modifications and return to previous menu
0 -- apply modifications and return to previous menu
1
host configuration :
1 -- server fqdn(global.roxe.fr.al-enterprise.com)
2 -- server ip address(172.25.187.128)
3 -- netmask(255.255.255.0)
4 -- gateway(172.25.187.1)
5 -- dns server(172.25.187.10)
6 -- reverse proxy public url(https://public.roxe.fr.al-enterprise.com)
7 -- ntp server(corp.local)
8 -- time zone(Europe/Paris)
9 -- enable high availability
0 -- return to previous menu
9
choose server ha type :
1 -- primary server
2 -- secondary server
in secondary server case, all information will be sent by the actived primary server
1
since host address will become virtual (no changes needed for clients),
new host address for local server is needed
enter ip address for primary server
172.25.187.97
enter ip address for secondary server
172.25.187.98
host configuration(primary) :



7.4.2.2 Secondary server

The procedure is the same as installation from scratch

7.4.3 Crash recovery

7.4.3.1 Primary server

Launch roxe-installer.sh

Press host configuration number

Press enable high availability number

Press 1 primary server

Press 2 crash recovery

Enter secondary server ip address

All information will be send to primary server by secondary server once services are started

```
[root@bstpiil1097 ~]# ./roxe-installer.sh
Extracting binaries...
Binaries extraction done
Installing application...
Application installation/update done
Installing/updating binaries...
configuration :
1 -- mandatory host configuration
2 -- mandatory license host configuration
3 -- mandatory oxe(s) configuration
4 -- administrators/users configuration
5 -- databases configuration
1
host configuration :
1 -- server fqdn(bstpiil1097.fr.alcatel-lucent.com)
2 -- server ip address(172.25.187.97)
3 -- netmask(255.255.255.0)
4 -- gateway(172.25.187.1)
5 -- dns server(172.25.187.10)
6 -- reverse proxy public url()
7 -- ntp server()
8 -- time zone(US/Eastern)
9 -- enable high availability
0 -- return to previous menu
9
choose server ha type :
1 -- primary server
2 -- secondary server
        in secondary server case, all information will be sent by the actived primary server
1
choose server installation type :
1 -- installation from scratch
2 -- crash recovery
        in crash recovery case, all information will be sent by the actived secondary server
2
enter ip address for secondary server
172.25.187.98
waiting for configuration availability from secondary server
configuration available
applying modifications...
applying modifications...done
Starting ROXE Services 1.0 SNAPSHOT
postgresql:
Application is managed by solution control                [  OK  ]
tomcat:
Application is managed by solution control                [  OK  ]
apache:
Application is                                            [STARTED]
flexlm:
Application is                                            [STARTED]
solution_control:
Application is                                            [STARTED]
Start time : 1s
Binaries installation/update done
boot media check :
version installed :     _12.1.008.004_
version delivered :     _12.1.009.001_
boot media : version needs update
Starting ROXE Services 1.0 SNAPSHOT
postgresql:
Application is managed by solution control                [  OK  ]
tomcat:
Application is managed by solution control                [  OK  ]
apache:
Application is                                            [STARTED]
flexlm:
Application is                                            [STARTED]
solution_control:
Application is                                            [STARTED]
Start time : 0s
```

7.4.3.2 Secondary server

The procedure is the same as installation from scratch

Chapter

8

Specific configurations

8.1 Specific Apache configurations

8.1.1 Flow control: Apache “mod_evasive”

The mod_evasive Apache module helps protect against DoS, DDoS (Distributed Denial of Service), and brute force attacks on the Apache web server. It can provide evasive action during attacks and report abuses via email and syslog facilities. The module works by creating an internal dynamic table of IP addresses and URIs as well as denying any single IP address from any of the following:

- Requesting the same page more than a few times per second
- Making more than 50 concurrent requests on the same child per second
- Making any requests while temporarily blacklisted

If one considers that these kinds of attacks won’t likely happen, the module should be disabled. In case of risk, the module can be activated with the following command:

```
“/opt/Alcatel-Lucent/apache/set_mod_evasive.sh on”
```

In the same way, the module can be inhibited with:

```
“/opt/Alcatel-Lucent/apache/set_mod_evasive.sh off”
```

The different configuration parameters may be modified through the following file:

```
/opt/Alcatel-Lucent/apache/configuration/conf/mod_evasive.conf
```

8.2 Specific Tomcat configurations

8.2.1 Cross Origin Resource Sharing(CORS)

ROXE server is designed to support CORS for its REST application client. This is implemented through Tomcat module.

(For example, if a web client application (JavaScript for example) is downloaded from a third-party server, and if the browser client request for origin authorization, then the ROXE server will check the origin of the request through its authorized url origin list and returns an Access-Control-Allow-Origin Header in its response)

A specific filter is defined in the Web configuration file web.xml:

```
<!-- Filter for CORS -->
<filter>
 <filter-name>CorsFilter</filter-name>
 <filter-class>org.apache.catalina.filters.CorsFilter</filter-class>

    <init-param>
         <!--param-value>http://my.server1.com,http://my.server2.com</param-value-->
         <param-name>cors.allowed.origins</param-name>
         <param-value></param-value>
    </init-param>
```

The param-value of the *<param-name>cors.allowed.origins</param-name>* shall be configured with the

allowed fqdn of the domain (white list) that are authorized for CORS operation, that is the origins for which the access to ROXE Rest service is authorized.

During ROXE installation (with roxe-install.sh script) or ROXE configuration (with roxe-config.sh script), the CORS white list parameter may be filled. If this parameter is changed, the white list is automatically injected in the web.xml file (refer to installation setup chapter and configuration chapter).

Chapter

9

Troubleshooting

9.1 System information

Some information is available in the server through the following URL

https://<host>/api/rest

Example:

```
GET http://{{host}}/api/rest

 -- response --
200 OK
Content-Type:  application/json;charset=ISO-8859-1
{
  "serverInfo" : {
    "productName" : "ROXE Services 1.0",
    "productType" : "ROXE",
    "productVersion" : {
      "major" : "14.0",
      "minor" : "000.006-SNAPSHOT"
      },
    "haMode" : false
  },
  "versions" : [ {
    "id" : "1.0",
    "status" : "CURRENT",
    "publicUrl" : "http://vm-roxe1.bstlabrd.fr.alcatel-
lucent.com/api/rest/authenticate?version=1.0",
    "internalUrl" : "http://vm-roxe1.bstlabrd.fr.alcatel-
lucent.com:80/api/rest/authenticate?version=1.0"
  } ]
}
```

9.2 Traces: Log4j

To have a vision of what is happening in the ROXE, traces can be positioned.

This can be done by 3 ways:

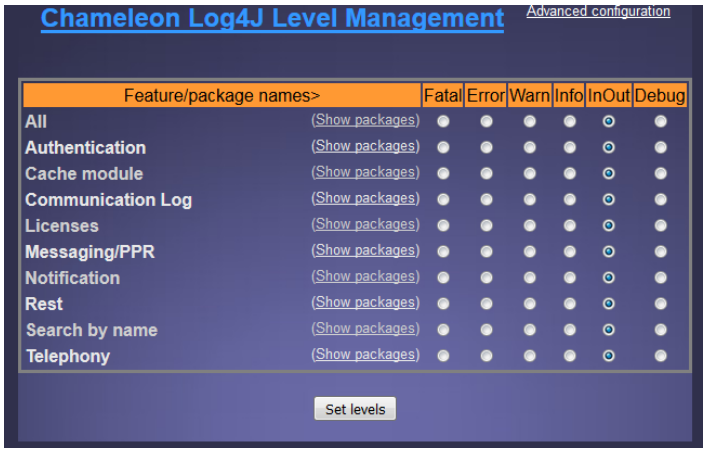
- By modifying some settings in the file (static mode):

```
/opt/Alcatel-Lucent/webapps/api/WEB-INF/classes/traces.xml"
```

Note: A ROXE restart is necessary.

- by using the web application "Log4jAdmin" (dynamic mode).

The URL is https://<host>/api/Log4jAdmin**Error! Hyperlink reference not valid.**
Note: No restart otherwise this configuration will be lost.

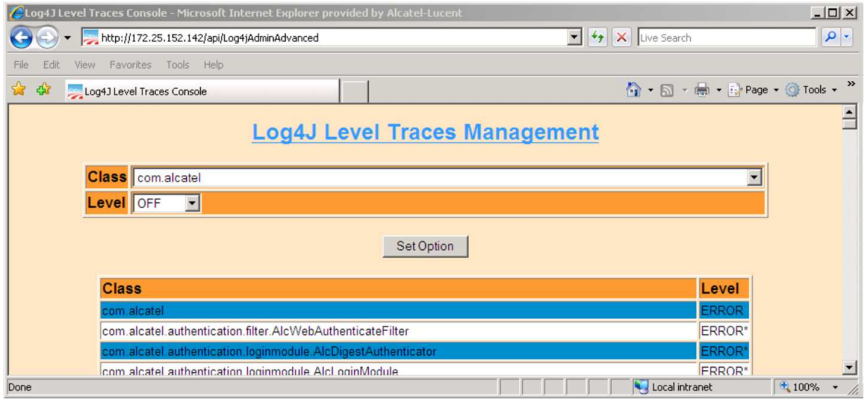


- by using the web application “Log4jAdminAdvanced” (dynamic mode).

The URL is :

```
“https://<host>/api/Log4jAdminAdvanced”
```

Note: No restart otherwise this configuration will be lost.



The result can be seen in the log files.

In the directory

“/logs/tomcat” information about Tomcat is available.

“/logs/tomcat/chameleon” information about ROXE and its plugins are available.

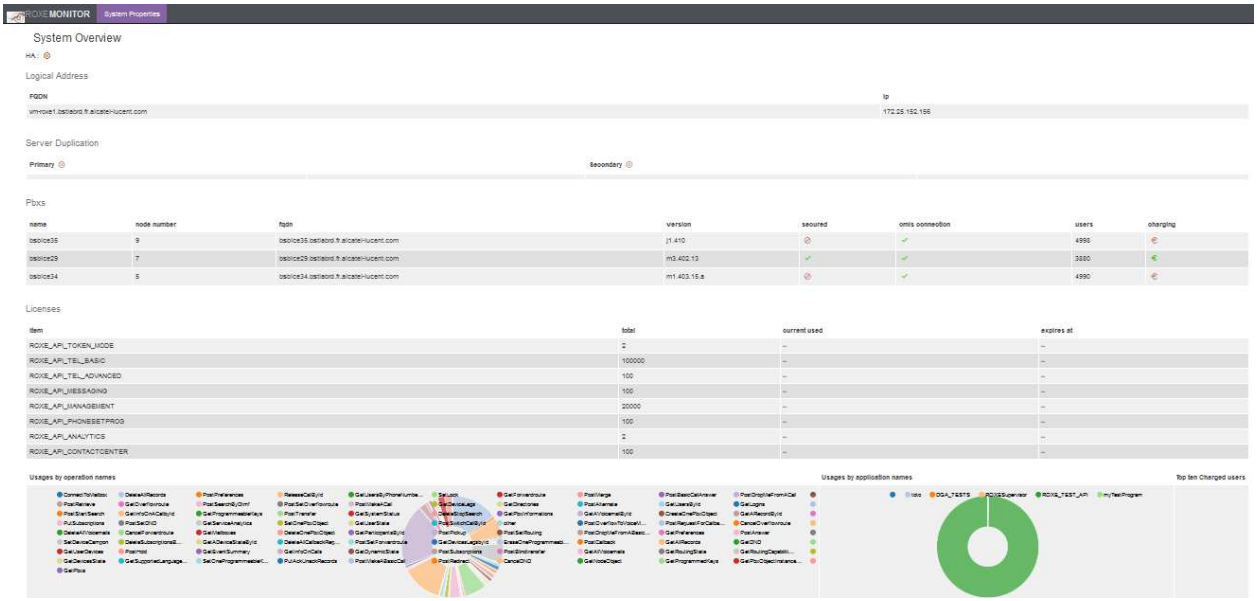
So, it is interesting to have a ZIP of the entire directory “/logs/tomcat” in a report.

CAUTION: A basic authentication mechanism has been implemented to access the Log level web pages. This requires an administrator login/password.

Chapter 9 *Troubleshooting*

9.3 Monitoring – status page

A statistics page is accessible though {your domaine}/api/sysstat/



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